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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/814,282 | 04/01/2004 | Toshikazu Yoshida | 1081.1195 | 8454 |

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| EXAMINER | |
|---|---|
| CHEN, ALAN S | |
| ART UNIT | PAPER NUMBER |
| 2182 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/22/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/814,282 | YOSHIDA ET AL. | |
| | Examiner | Art Unit | |
| | Alan S. Chen | 2182 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/01/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of claims 1-5 in the reply filed on 12/12/2006 is acknowledged.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the address acknowledge signal" in line 4. There is insufficient antecedent basis for this limitation in the claim. To expedite prosecution, Examiner will assume applicant means any type of acknowledge signal.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1 and 2-5 are rejected under 35 USC 103(a) as being unpatentable over US Pat. No. 5,724,609 to Hatae et al. *(Hatae)* in view of US Pat. Pub. No. 2003/0005231 to Ooi et al. *(Ooi)*.

7. Per claim 1, Hatae discloses an integrated circuit device *(Fig. 1)* having a send/receive macro *(Fig. 1, element 26)* for transferring addresses and data to or from an external device *(Fig. 1, element 44)* via a bus *(Fig. 1, elements 36-40 is a bus that has address and data information)*, the integrated circuit device comprising: a CPU for performing predetermined processing *(Fig. 1, element 10)*, wherein the send/receive macro comprises: a send/receive buffer accessed by the CPU *(Fig. 1, element 30)*, for storing a plurality of units of data to be transmitted to or received from the bus; an acknowledge detection unit for detecting a data acknowledge signal transmitted from a receiving device in response to transmission of predetermined units of data *(Fig. 8,*

*element 58)*; and a data send unit *(Fig. 1, element 28)* for transmitting data stored in the send/receive buffer, in response to detection of the data acknowledge signal by the acknowledge signal detection unit, without generating any interrupt to the CPU *(Fig. 8, element 60 suppresses interrupt to reduce interrupts to the CPU; Column 9, loines 15-55)*, and wherein the acknowledge detection unit generates a data acknowledge signal non-detection interrupt to the CPU if the acknowledge detection unit does not detect the data acknowledge signal transmitted from the receiving device in response to transmission of the predetermined units of data *(Column 11, lines 5-20 disclose after a fixed timeout period, regardless of whether the data has finished transferring, interrupt is released, thus if data transfer completion has been not been acknowledged and timeout period exceeded, the interrupt will be released)*.

Hatae does not disclose expressly the bus and external device *(Fig. 1, element 44, the magnetic disk unit)* being serial based.

Ooi discloses use of serial ATA hard drive and associated serial bussing schemes *(Fig. 1, element 176)* and use of DMA *(Fig. 1, element 150 and paragraph 27)*.

Hatae and Ooi are analogous art because they are from similar problem solving area in how to minimize interrupts to the CPU with the use of DMA, directed to data transfer to a hard drive.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use a serial protocol for the bus and hard drive.

The suggestion/motivation for doing so would have been to increase flexibility of the system by being able to handle both serial and parallel protocols *(as suggested in*

*Ooi, Fig. 1, shows ability to interface either parallel or serial ATA protocols).* Serial ATA is also known to be faster and the hard drive itself can be placed at a farther distance than parallel ATA drives.

8. Per claim 2, Hatae combined with Ooi discloses claim 1, Hatae further disclosing the data transmission from the data send unit is terminated in response to the data acknowledge signal non-detection interrupt to the CPU *(Fig. 12, signals E13 and E1 show that the DMA data has stopped sending by the time the timeout ended. Any data occurring after E1 has been signaled will be ended).*

9. Per claim 4, Hatae combined with Ooi discloses claim 1, wherein the data send unit initiates transmission of predetermined units of data stored in the send/receive buffer *(Fig. 4, element 114, DMA START initiates transfer)*, after an interrupt to the CPU generated when the acknowledge detection unit detects an acknowledge signal *(Fig. 4, element 113, DMA start signal received at the bus controller, element 26).*

10. Per claim 5, Hatae combined with Ooi discloses claim 1, wherein the bus comprise a data line *(Fig. 1, element 40)* and a control line *(Fig. 1, element 36 is control line)*, the control line controlling the data line.

***Allowable Subject Matter***

11. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is the statement of reasons for the indication of allowable subject matter: The prior art disclosed by the applicant and cited by the Examiner fail to teach

or suggest, alone or in combination, ***all*** the limitations of the independent claim(s) (claim 1), particularly being able to detect an address acknowledge signal in addition to a data acknowledge signal, such the address acknowledge signal is sent by a slave device in response to transmission of an address identifying the slave device, causing the acknowledge detection unit to generate an interrupt to the CPU.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patents and patent related publications are cited in the Notice of References Cited (Form PTO-892) attached to this action to further show the state of the art with respect to DMA techniques generating detect and non-detection type interrupts.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S. Chen whose telephone number is 571-272-4143. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on 571-272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASC
02/19/2007

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